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| EXAMINER | |
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| MONIKANG, GEORGE C | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/802,388 | HERNANDEZ ET AL. | |
| | Examiner | Art Unit | |
| | GEORGE C. MONIKANG | 2614 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *18 June 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/18/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments filed 6/18/2008 have been fully considered but they are not persuasive. With respect to applicant's argument that the detecting of the modified sound (*abstract*) without requiring additional sound input from the second location. The examiner maintains his stand, the second electrical signal was created to cancel the noise from the first electrical signal without utilizing the sound from the second sound location (*abstract: the second electrical signal was created to cancel the noise from the first electrical signal without utilizing the sound from the second sound location*).

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-2, 4-6 & 8-23 & 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raviv, US Patent 5,444,786, in view of Enzmann et al, US Patent 5,844,996. (The Raviv and enzmann et al references are cited in IDS filed 3/18/2005)

Re Claim 1, Raviv discloses a system for sound cancellation comprising: a source microphone for detecting sound propagating from a sound source (*col. 3, lines 58-62*); a computational module in communication with the microphone and the speaker (*col. 3, line 66 through col. 4, line 9*), the computational module configured to receive a signal from the microphone (*col. 3, line 66 through col. 4, line 9*), identify a cancellation signal using a predetermined adaptive filtering function responsive to an acoustic environment of the cancellation location (*col. 3, lines 49-57*), and transmit a cancellation signal to the speaker (*fig. 1: 25 & 32; col. 3, lines 49-57*) but fails to disclose a speaker configured to direct a canceling sound toward a cancellation location that is spatially remote from the sound source as taught in Enzmann et al (*Enzmann et al, fig. 1: 18 & 46; col. 4, lines 40-53*). It would have been obvious to use the canceling noise speakers of Enzmann et al (*Enzmann et al, fig. 1: 18 & 46; col. 4, lines 40-53*) with the system for sound cancellation of Raviv for the purpose of creating a noise free zone to a non-snoring occupant of a bed.

Re Claim 2, the combined teachings of Raviv and Enzmann et al disclose the system of claim 1, further comprising a training sub-system having at least one training microphone that can be placed at the cancellation location (*Raviv, col. 4, lines 53-59*).

Re Claim 4, the combined teachings of Raviv and Enzmann et al disclose the system of claim 2, wherein the predetermined adaptive filtering function is determined

by receiving a first sound input from the source microphone (*Raviv, col. 3, lines 58-62*), receiving a second sound input from the training microphone (*Raviv, col. 4, lines 53-59*), and then determining the adaptive filtering function (*Raviv, col. 3, lines 49-57*), wherein the predetermined adaptive filtering function is adaptive to a sound transformation between the source microphone signal and the training microphone signal (*Raviv, col. 3, lines 49-57; col. 4, lines 53-59*).

Re Claim 5, the combined teachings of Raviv and Enzmann et al disclose the system of claim 1, wherein the predetermined adaptive filtering function comprises a function that identifies a sound transformation between the source microphone and the cancellation location without contemporaneous sound input at the cancellation location (*Raviv, col. 6, lines 29-35*).

Re Claim 6, the combined teachings of Raviv and Enzmann et al disclose the system of claim 4, wherein the cancellation location is spatially removed from the source microphone and speaker (*Raviv, col. 3, lines 58-65*).

Re Claim 8, the combined teachings of Raviv and Enzmann et al disclose the system of claim 1, further comprising at least one locating sensor (*Raviv, col. 4, lines 5-9*).

Re Claim 9, the combined teachings of Raviv and Enzmann et al disclose the system of claim 8, wherein the locating sensor is configured to determine a location of a subject (*Raviv, col. 4, lines 5-9*).

Re Claim 10, the combined teachings of Raviv and Enzmann et al disclose the system of claim 9, wherein the predetermined adaptive filtering function determines an

approximate sound transformation as a function of the location of the subject (*Raviv, col. 3, lines 42-57*).

Re Claim 11, the combined teachings of Raviv and Enzmann et al disclose the system of claim 8, wherein the locating sensor is configured to determine a location of a sound source (*Raviv, col. 4, lines 5-9*).

Re Claim 12, the combined teachings of Raviv and Enzmann et al disclose the system of claim 11, wherein the adaptive filtering function determines an approximate sound transformation at a cancellation location based on the location of the sound source (*Raviv, col. 3, lines 42-57*).

Re Claim 13, the combined teachings of Raviv and Enzmann et al disclose the system of claim 8, further comprising at least one locating sensor configured to determine a location of a sound source (*Raviv, col. 4, lines 5-9*), wherein the adaptive filtering function comprises a function that determines an approximate sound transformation at the location of the subject based on the location of the sound source (*Raviv, col. 3, lines 31-37; col.3, lines 42-57*).

Re Claim 14, the combined teachings of Raviv and Enzmann et al disclose the system of claim 1, wherein the speaker is a parametric speaker for broadcasting ultrasonic sound (*Raviv, col. 10, line 56 through col. 11, line 6*), the parametric speaker configured to broadcast a localized cancellation sound at the cancellation location (*Raviv, col. 3, lines 62-65*).

Re Claim 15, the combined teachings of Raviv and Enzmann et al disclose the system of claim 1, wherein the speaker comprises a plurality of speakers (*Raviv, col. 3, lines 42-48*).

Re Claim 16, the combined teachings of Raviv and Enzmann et al disclose the system of claim 1, wherein the computational module further comprises a screening module that can analyze signals from the source microphone for indications of a health condition comprising abnormal breathing (*Raviv, col. 3, lines 49-57; snore sound source; abstract*).

Re Claim 17, the combined teachings of Raviv and Enzmann et al disclose the system of claim 16, wherein the computational module further comprises: a communicating module (*Raviv, fig. 4b: 48 & 50a-50c; col. 10, line 56 through col. 11, line 6*) configured such that, if the screening module detects a health condition (*Raviv, col. 3, lines 49-57: snore sound source*), the communicating module communicates the detection of a health condition (*Raviv, col. 10, line 56 through col. 11, line 6*), and wherein the communicating module comprises an acoustic mechanism (*Raviv, col. 10, line 56 through col. 11, line 6: ultrasonic sensor*).

Claim 18 has been analyzed and rejected according to claim 1.

Re Claim 19, the combined teachings of Raviv and Enzmann et al disclose the method of claim 18, further comprising training an algorithm to provide the adaptive filtering function (*Raviv, col. 3, lines 49-57; col. 4, lines 53-59*).

Claim 20 has been analyzed and rejected according to claim 4.

Re Claim 21, the combined teachings of Raviv and Enzmann et al disclose the method of claim 20, further comprising obtaining a second signal using a training system comprising at least one microphone (*Raviv, col. 4, lines 53-59*), the training system being at least one of: head-wearable device and positionable at desired location of cancellation (*Raviv, col. 4, lines 53-59*).

Re Claim 22, the combined teachings of Raviv and Enzmann et al disclose the method of claim 21, further comprising providing a training device comprising a head surrogate comprising a three dimensional object and at least one microphone (*Raviv, col. 4, lines 53-59*).

Claim 23 has been analyzed and rejected according to claim 16.

Re Claim 37, the combined teachings of Raviv and Enzmann et al disclose the system of claim 1, wherein the sound source comprises a snoring individual and the speaker is nor wearable by the snoring individual (*Enzmann et al, fig. 1: 46*).

Re Claim 38, which further recites, "Wherein the predetermined adapted filtering function includes a situational transfer matrix function, W, **W = 1/(d-e'e)** wherein e is a transfer function for sound propagation from the sound source to the source microphone, e is a transfer function for sound propagation from the speaker to the cancellation location, and d is a transfer function for sound propagation from the source microphone to the speaker, and the * operator denotes mathematical convolution." Raviv and Enzmann et al do not disclose the transfer matrix function, W, **W = 1/(d-e'e)** as claimed. Official notice is taken that both the concepts and advantages of using various transfer matrix functions to perform adaptive filtering are well known in the art.

Thus it would have been obvious to use the transfer matrix function, W, **W = 1/(d-e'e)** so the system could self-adjust itself according to optimizing algorithms.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Raviv, US Patent 5,444,786 and Enzmann et al, US Patent 5,844,996 as applied to claim 1 above, in view of Parkins, US Patent 6,665,410 B1.

Re Claim 3, the combined teachings of Raviv and Enzmann et al disclose the system of claim 1, but fail to disclose further comprising a temperature sensor in communication with the computational module, wherein the predetermined adaptive filtering function is responsive to the temperature of the acoustic environment as taught in Parkins (*Parkins, col. 4, lines 35-49*). It would have been obvious to incorporate the temperature sensor of Perkins (*Parkins, col. 4, lines 35-49*) into the system of Raviv and Enzmann et al for the purpose of compensating for the change in temperature & humidity in a given space.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Raviv, US Patent 5,444,786 and Enzmann et al, US Patent 5,844,996 as applied to claim 1 above, in view of Raviv's admitted prior art (*hereinafter referred to as RAAPA; col. 2, lines 4-14*).

Re Claim 7, the combined teachings of Raviv and Enzmann et al disclose the system in claim 1, but fail to disclose wherein the source microphone comprises a plurality of source microphones as taught in RAAPA (*RAAPA, col. 2, lines 4-14*). It

would have been obvious to use the multiple microphones of RAAPA (*RAAPA, col. 2, lines 4-14*) with the system of Raviv and Enzmann et al for the purpose of the sound source signal better facilitates cancellation.

7. Claims 24 & 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Enzmann et al, US Patent 5,844,996. (The Enzmann et al reference is cited in IDS filed 3/18/2005)

Re Claim 24, Enzmann et al discloses a method for canceling sound, comprising: detecting first sound at a first location (*abstract*); detecting a modified second sound at a second location, the modified second sound being a result of sound propagating to the second location (*abstract*); determining an adaptive filtering function (*col. 2, lines 40-43*), approximating the second modified sound from the first sound (*abstract*); halting detecting of the modified sound (*abstract: the second electrical signal was created to cancel the noise from the first electrical signal without utilizing the sound from the second sound location*); and determining a cancellation signal proximate the second location from the first sound (*abstract*) and the adaptive filtering function (*col. 2, lines 40-43*).

Re Claim 25, Enzmann et al discloses a method for canceling sound, comprising: detecting first sound at a first location (*abstract*); detecting a modified second sound at a second location, the modified second sound being a result of sound propagating to the second location (*abstract*); determining an adaptive filtering function (*col. 2, lines 40-43*), approximating the second modified sound from the first sound (*abstract*); halting

detecting of the modified sound (*abstract*) without requiring additional sound input from the second location (*abstract: the second electrical signal was created to cancel the noise from the first electrical signal without utilizing the sound from the second sound location*).

8. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sullivan et al, US Patent 5,199,424.

Re Claim 26, Sullivan et al discloses a method for analyzing sound for health conditions (*col. 4, lines 44-60*), comprising: providing a microphone spatially remote from a subject (*col. 4, lines 44-60*); analyzing a sound input to the microphone to determine if a change in respiratory sounds occurs sufficient to identify a health condition comprising abnormal breathing (*col. 4, lines 44-60*). Even though, Sullivan et al fails to disclose the microphone being spatially remote from a subject, it would have been obvious to use a directive microphone further away from the user of Sullivan et al for the purpose of creating a dynamic system.

9. Claims 27, 30-31 & 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Enzmann et al, US Patent 5,844,996.

Re Claim 27, Enzmann et al discloses a system for sound cancellation comprising: a source microphone for detecting sound (*abstract*); a speaker (*abstract*) configured to transmit a canceling sound configured to cancel the detected sound such that the canceling sound is localized with respect to a cancellation location (*fig. 1: 18 &*

*46; col. 4, lines 40-53*). Even though, Enzmann et al fails to disclose the speaker being a parametric speaker, it would have been obvious to use a parametric speaker in Enzmann et al for the purpose of directing the noise cancellation signal to the non snorer.

Re Claim 30, Enzmann et al discloses the system of claim 27, further comprising: a computational module in communication with the microphone and the speaker (*Enzmann et al, fig. 1: 18 & 46; col. 4, lines 40-53*), the computational module configured to receive a signal from the microphone (*Enzmann et al, fig. 1: 18 & 46; col. 4, lines 40-53*), identify a cancellation signal using a predetermined adaptive filtering function responsive to an acoustic environment of the cancellation location (*Enzmann et al, col. 2, lines 40-43*); and transmit a cancellation signal for producing the canceling sound to the speaker (*Enzmann et al, fig. 1: 18 & 46; col. 4, lines 40-53*).

Claim 31 has been analyzed and rejected according to claim 27.

Re Claim 36, the combined teachings of Raviv and Enzmann et al disclose the system of claim 31, further comprising at least one locating sensor configured to determine a location of a sound source (*Enzmann et al, fig. 1: 26; col. 3, line 61 through col. 4, line 10*), wherein the adaptive filtering function comprises a function that determines an approximate sound transformation at the location of the subject based on the location of the detected sound (*Enzmann et al, fig. 1: 26; col. 3, line 61 through col. 4, line 10*).

10. Claims 28-29 & 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raviv, US Patent 5,444,786, in view of Enzmann et al, US Patent 5,844,996.

Re Claims 28 & 32, Enzmann et al discloses the method of claims 27 & 31 respectively, but fails to disclose wherein transmitting a canceling signal further comprises transmitting a plurality of ultrasonic signals wherein the canceling signal is formed from the interaction of the plurality of ultrasonic signals (*Raviv, fig. 4b: 42, 32, 40; col. 10, line 56 through col. 11, line 6*). It would have been obvious to use the ultrasonic signals of Raviv (*Raviv, fig. 4b: 42, 32, 40; col. 10, line 56 through col. 11, line 6*) with the method of Enzmann et al for the purpose of directionally creating a noise fee zone of a non-snoring occupant in bed.

Re Claim 29, the combined teachings of Enzmann et al and Raviv disclose the system of claim 27, wherein the parametric speaker produces the canceling sound by nonlinear interaction of an ultrasonic signal with air (*Raviv, fig. 4b: 42, 32, 40; col. 10, line 56 through col. 11, line 6: parametric speakers are nonlinear*).

Claim 33 has been analyzed and rejected according to claim 29.

Re Claim 34, the combined teachings of Enzmann et al and Raviv disclose the method in claim 31 wherein the canceling signal is formed from an interaction between a plurality of ultrasonic signals that creates a difference signal among the ultrasonic signals at the cancellation location (*Raviv, col. 11, lines 7-12; col. 11, lines 21-32*).

Re Claim 35, the combined teachings of Enzmann et al and Raviv disclose the method in claim 31 wherein the ultrasonic signal comprises a carrier frequency component and a modulation component and nonlinear interaction between the carrier

frequency component and the modulation component in air creates a cancellation sound by demodulation of the ultrasonic signal that is in a generally audible frequency range along the propagation path of the ultrasonic signal (*Raviv, col. 10, line 56 through col. 11, line 6:ultrasonic speakers are nonlinear; col. 12, lines 8-25*).

## Contact

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to GEORGE C. MONIKANG whose telephone number is (571)270-1190. The examiner can normally be reached on M-F. alt Fri. Off 7:30am-5:00pm (est).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/George C Monikang/ 11/25/2008
Examiner, Art Unit 2614

/Xu Mei/
Primary Examiner, Art Unit 2614